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ABSTRACT

Surveys were returned from 40 of 235 climbing gyms nationwide in an effort to identify or verify issues concerning the design, construction, and use of artificial climbing walls. The survey was complemented by discussions with wall manufacturers, architects, engineers, climbing gym owners, wall managers and staff, competition organizers, and climbers. Results indicate that the size of climbing gyms has increased during the 1990s, with most gyms reporting between 5,000 and 6,100 square feet of climbable surface. While experienced climbing wall manufacturers are being kept busy, most walls today are built by local carpenters and climbers. This results in lower construction costs, but also design, construction, and operational problems. Other problems are associated with educating and promoting the climbing wall concept to administrators, agencies, and others who may impact the decision-making process. Prominent or recurring themes such as space, design, and location were cited both as problems experienced by gyms and as features critical to gym success. Conclusions include a need for detailed planning; a need for planners to experience climbing and to confer with the climbing community; and a need for adequate space surrounding the wall to address safety issues and supporting services. (Contains eight tables presenting survey results and a list of steps for the design and development of a climbing gym project.) (TD)

CLIMBING WALLS: FROM FORM TO FUNCTION

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ABSTRACT:

The climbing wall industry has enjoyed phenomenal growth during the 90's while experiencing the growing pains of a budding field. This paper includes results of a survey that was developed to examine issues related to the development and programming of climbing facilities and programs and provide insights from those who have experienced the process from conceptual design to operations.

Design and construction of artificial climbing structures has become a multi-million dollar business. In the United State alone, more than 200 climbing wall programs have been developed in the last seven years.

In an effort to gain a deeper understanding of the industry and to identify or verify issues concerning the design, construction, and use of climbing walls, the author conducted a survey of 235 climbing gyms in 43 states in the fall of 1997. Forty surveys (n=40, 17% of the sample), were returned in various states of completion from the initial survey. Therefore, the number of those reporting on each item of the survey is provided in the results. Some items on the survey (total square feet of climbable surface, n = 88, and height, n = 84) were obtained from the climbing gym web site developed by the Phoenix Rock Gym and other gyms responding to the survey. The results of the initial survey are provided in table form with a brief discussion of each item for quantitative data and questions, response lists, and discussion for qualitative data. A second mailing of the survey is currently underway and updated results will be available from the author in May of 1998.

In addition to the survey, the author conducted numerous discussions with wall manufacturers, architects, engineers, climbing gym owners, wall managers and staff, competition organizers, and of course, climbers. Knowledge gained from these discussions and personal experience also helped shape the ideas and information contained in the discussion of the data and in the summary and conclusion that follows the survey results

Climbing Gym Survey Results

Table 1
Measures of Central Tendency in Square Feet
Reported in Total and by Specific Climbing Area Type

n = # responding	88	7	8	16
	Total	Top Rope	Lead	Bouldering
Mean	6098	3572	2132	610
Median	5000	4000	2500	1000
Mode	6000	4000	3000	1000

Note: Mean total square feet from 1990 study = 1652
From Survey of Selected Climbing Gyms in North America
ORCA Outdoor Programmer's Resource Guide (25 Gyms Surveyed)

Table 2
Mean Percent of Wall Space
Dedicated to Specific Climbing Wall Area Types

n = # responding	88	7	8	16
	Total	Top Rope	Lead	Bouldering
Mean Square Feet	6098	3572	2132	610
Avg. % of Space		**59%**	**35%**	**10%**

Table 3
Measure of Variability in Square Feet
Reported in Total and by Specific Climbing Area Type

n = # responding	88	7	8	16
	Total	Top Rope	Lead	Bouldering
Range	19,500	6800	5160	2204

Notes:

1) Largest Gym Responding — Upper Limits Rock Gym, Bloomington, IL — 20,000

2) Smallest Gym Responding — Fillmore Elementary School, Hamilton, OH — 500

Table 4
Adjusted Mean in Square Feet
Reported in Total and by Specific Climbing Area Type

n = # responding	86	5	6	14
	Total	Top Rope	Lead	Bouldering
Adjusted Mean	6001	3800	2342	974

Note: The largest and smallest gym measurements were removed from the data set for each item listed in Table 4 to achieve the adjusted mean measurements.

Measures of central tendency for total square feet and specific climbing areas including top rope, lead, and bouldering area for climbing gyms responding to the survey are reported in Table 1. Mean percent of climbable surface dedicated to specific climbing areas is found in Table 2 and the range in total square feet and specific climbing areas for climbing gyms responding to the survey is shown in Table 3. Notes are provided for further clarification of the results.

The results suggest, that the mean size of climbing walls have increased significantly since 1990, when the author surveyed 25 gyms and reported a mean total square feet of 1652. The data also indicates that climbing gyms are using climbable surface for more than one purpose or overlapping specific use areas. The results of the measure of variability for those responding to the survey show a wide range in the square feet reported by climbing gyms responding. Therefore, an adjusted mean in total square feet and specific climbing areas is reported in Table 4, and was determined by removing the largest and smallest measurements from each data set. The results of Table 4 add credence to measures of central tendency reported in Table 1.

Table 5
Mean Total Project Cost, Mean Square Feet of Climbable Surface and Mean Total Cost per Square Foot for Gyms Reporting Total Costs

n = 31	Mean Total Project Cost	Mean Total Square Feet	Mean Tot. Cost/Sq. Ft.
	$121,823	7875	$15.47

Table 6
Mean Itemized Project Costs and Total of Mean Itemized Project Costs For Gyms Reporting Itemized Costs

Column	A	B	C	
n = # responding	10	22	24	variable
	Design	Construction	Equipment	Total of A,B,C
Mean Itemized Costs	$6280	$72,055	$18,938	$97,273

Table 7
Mean Itemized Project Costs per Square Foot, Total of Mean Itemized Project Costs per Square Foot, and the Mean Total Square Feet per Type of Itemized Cost, for Gyms Reporting Itemized Costs

Column	A	B	C	
n = # responding	10	22	24	variable
	Design	Construction	Equipment	Total of A,B,C
Mean Development Costs	$1.75	$8.26	$4.80	$14.81
Mean Total Sq. Ft. per Item	3589	8723	3945	

The mean total project costs associated with design, construction, start-up equipment, mean square feet and cost per square foot for gyms reporting itemized project costs is shown in Table 5. The mean itemized costs and sum of the itemized costs for gyms responding to these specific survey items is found in Table 6. In Table 7, the mean itemized project costs per square foot, the total of mean itemized project costs per square foot, and the mean total square feet per type of itemized development cost for gyms reporting itemized costs are reported. It should be noted that for Tables 6 and 7, mean itemized costs were determined by using the mean costs and square feet for only those gyms reporting each specific type of itemized cost.

The survey results shown in Tables 5-7 provide interesting information concerning costs associated with the development of climbing wall projects. It should be noted that the mean size of gyms reporting costs in Table 5 (7875 sq. ft.) is considerably higher than the mean (6098 sq. ft.) reported in Table 1. Secondly, some gyms responding reported only construction and equipment costs because they designed their gym as a personal project and did not associate costs with this part of project development. Twenty-two of the gyms responding were designed and built by climbing gym staff or local contractors which may account for the relatively low mean costs associated with project design and construction, shown in both Tables 5 and 7. It is also interesting to note that the normal range of total cost per square foot for gyms built by climbing wall manufacturers is $40-65 per square foot in terms of the issues raised concerning project development problems under Survey Question 1 in the Qualitative Data section.

Table 8
Mean Total Number of Route Stations and
Mean Number of Route Stations per 1000 Square Foot by Route Type
For Gyms Responding to the Survey

n = # responding	27	12	5
Type of Climbing Area	Top Rope	Lead	Boulder
Mean Tot. Number of Route Stations per Gym	18	12	4
Mean Number of Route Stations per 1000 sq. ft.	4	2	1

Information concerning the mean total number of route stations and the mean number of route stations per 1000 square foot for gyms responding to the survey is provided in Table 8. This data was compiled to provide information that may be useful in project development and/or re-engineering. To provide additional meaning to the information in this table, the mean height for 84 climbing gyms listed on the web is 33 feet.

Qualitative Data Compiled from the Survey

235 Gyms Surveyed, 40 Surveys completed and returned, a 17% Return rate .
The following are survey questions (in bold), lists of compiled responses, and discussion of issues raised by the responses to each question:

Survey Question 1.
What problems did you experience in the development of your climbing gym?

Thirty climbing gyms (75% of those responding) reported one or more problems with the development of their project. Responses were compiled and categorized into comment themes listed below. Some responses fit more than one theme category and were counted as responses in all categories that were applicable. The number of total responses and percent of those responding is noted in parentheses after each comment theme. The number of responses listed under each comment theme is one unless indicated with a number in parentheses after each response listed.

Design (11, 28%)
Unable to access the inside/back of walls in dealing with repairs (2), plans did not fit space, hard to retrofit climbing wall in existing space, safety flooring/landing not included in the project, floor could not support wall, work station not included in design, supervision of wall not considered in design (2), programming potential/needs not considered in design (2), texturing of the wall is problematic.

Equipment (11, 28%)
Problems with bolts, spinning t-nuts (3), floor anchors, mats, safety flooring materials (2), lighting, repair materials, and holds.

Time (10, 25%)
Not enough time for program development, too much time in project development, time delays due to fire/zoning/plan approval (3), agency bureaucracy, developing projects without architects and engineers, working with companies and individuals who do not have experience or are not stable businesses, too much time in construction phase, too much time in program design phase.

Money (9, 23%)
Cost overruns (3), cash flow (2), raising money for project development (3), cost of climbing and support equipment not included in the project.

Working with Institutions and Agencies (9, 23%)
Fire codes (2), engineering approval, architects, city permits (2), school administration, insurance agencies. Difficulties in communicating needs when working with companies and individuals who do not have experience or are not stable businesses.

Location (5, 13%)
Low participation because club is for members only, located in basement of old facility, located far from target market group, located in highly visible area, not located in highly visible area.

Discussion of Responses for Question 1.
Comment themes concerning project development problems in descending order of the number of responses received, include: design and equipment (11 responses in each category, 28%), time (10 responses, 25%), money and working with institutions and agencies (both with 9 responses, 23%), and location (5 responses, 13%). The compiled responses identify many issues common to the development of a variety of types of construction projects, such as delays due to permits, zoning, and engineering, cost overruns, bureaucracy, and communication of design or program needs. Many of these issues are beyond the control of the user, but may be mitigated by employing professional assistance in the project development phase and through detailed planning.

The design and equipment categories topped the list of project development problems, providing a host of issues including: difficulties in the development or application of design plans; inclusion of safety features, operational equipment, and/or work or storage spaces in the project plan; problems with wall operations or maintenance due to failure of the host structure, equipment or materials.

The precious commodity of time was cited as a project development problem for 10 (25%) of those responding to the survey. Issues regarding delays for approval, permits, and/or meeting building codes were the most frequent responses. Developing projects without professional or experienced assistance, and too much time in program or design development were other issues that created frustrations for survey respondents.

Money problems were reported by only nine (23%) of those responding to the survey. Cost overruns, cash flow problems, and raising money for project development were the three types of money problems cited by respondents. Detailed planning in the design phase of the facilities and sound business planning practices were cited by those gyms who did not report project development problems.

It is an interesting concept working with agencies that do not have a clear understanding of the climbing wall industry. Nine gyms (23%) of those responding to the survey reported issues related to working with agencies and institutions, citing: meeting codes; obtaining engineering approval or city permits; and working with architects, school administration, insurance agencies, and contractors as stumbling blocks in the development of their projects.

As with any business or service operation, location is extremely important, however, due to the fact that climbing gym operations require vertical space, it may be difficult to locate or define spaces or facilities that provide appropriate vertical space and visibility, proximity to target market groups, and/or activity area security. Creative concepts employed by some climbing gyms include the development of climbing walls in unused or underused facilities such as churches, grain silos, warehouses, barns, racquetball courts, and gymnasiums.

Survey Question 2.
What problems have you experienced in the use or programming of your climbing gym?

Twenty-three gyms (58% of those responding) reported one or more problems with programming. Responses were compiled and categorized into comment themes. The number of total responses and percent of those responding is noted in parentheses after each

comment theme. The number of responses listed under each comment theme is one unless indicated with a number in parentheses after each response listed.

Program Operations (15, 38%)
Route setting (3), supervision (3), instructional systems, not enough time for program development, noise from other activities, marketing, dust, need larger harnesses, belay device and/or chalk theft (2), baby-sitting.

Participation (14, 35%)
Not enough during specific times or seasons (5), too much to handle (3), parents not interested in participating, attitudes of visiting climbers, programming for special needs (2), kids playing on the wall (2).

Space or Design (14, 35%)
Crowded at certain times, need more space (3), no or inadequate work station (2), sharing space is difficult to coordinate, space not suitable for specific climbing activities, limited space hinders ability to offer clinics, traffic bottlenecks, difficult to view competitions, difficult to supervise, difficult to have instruction and open climbing or other activities operating simultaneously, project research conducted by individuals who did not have experience in the development of climbing walls.

Staffing (11, 28%)
Recruiting qualified staff (3), staff motivation, keeping qualified staff, finding good route setters (3), consistency of staff in testing and supervision, getting staff to work specific hours/days, work ethic.

Multi-Use Needs (6, 15%)
Children and adults, groups and informal climbing, other sports/activities and climbing, instruction and informal climbing (2), locals and visiting climbers.

Education (5, 13%)
Keeping kids attention, justification for safety training, development of instructional systems, constant educational needs of clients and staff (2).

Discussion of responses for question 2.
Problems related to programming offer important information to those contemplating the development of a climbing wall facility and program as well as gyms that are in operation. Although examining the problems climbing gyms are experiencing in programming may be more easily addressed in the project development phase, creative re-engineering of spaces can resolve some issues. Responses for Question 2. fit into the following category themes in descending order of the number of responses received: program operations (15 responses, 38%), participation (14 responses, 35%), space and design, and staffing categories both recorded (8 responses, 20%), multi-use needs (7 responses, 18%), and education (4 responses, 10%).

Responses under the theme category program operations indicate that route setting and supervision of the climbing wall are the most common programming issues for those responding to the survey. Other program operation issues are related to environmental conditions, equipment needs, and potential program service needs (baby sitting).

The participation category offered a mixed bag of results including: too much and not enough participation, problems with climber attitudes, programming for special needs, and children playing at the wall. This category provides fodder for the creation of new programs and services that would relieve participation problems.

Space and design problems once again won recognition in question 2 of the survey. It is interesting to note that although the mean total square feet of climbing surface reported by

climbing gyms has increased 370% in the last seven years, respondents report problems related to crowding, needs for space, and traffic bottlenecks. Some important design and space issues are not realized until a wall is in operation. Climbing gyms noted programming issues that could be addressed in the design phase, including: space for specific programming needs such as group events or instructional programs, design issues related to climbing competition venue needs, work station needs, the ability to supervise wall operations, and design issues related to types of programs and simultaneous use by different user groups.

Staffing problems were cited by 11 (28%) of those responding to the survey. Over half of those responding identified recruitment and retention of staff or the need for staff with specialized skills such as route setting as staffing issues that effect programming. Other problems related to employee behavioral issues such as motivation, work ethic, and commitment to agency needs were reported by those responding.

Multi-use needs were reported as programming problems for six (15%) of the gyms responding to the survey. Responses in this category involved problems associated with different user groups or program types utilizing the wall simultaneously.

Five (13%) responses were compiled under the category theme of education. Program problems cited were not related to project development.

Survey Question 3.
What are the wall features, that you feel, are critical to the success of your gym?

Twenty-two gyms (55% of those responding) reported one or more features that are critical to the success of their climbing gym? Responses were compiled and categorized into comment themes and are listed in descending order of the number of theme responses received. Some responses fit more than one theme category and were counted as responses in all categories that were applicable. The number of total responses and percent of those responding is noted in parentheses after each comment theme. The number of responses listed under each comment theme is one unless indicated with a number in parentheses after each response listed.

Design (17, 43%)
Interesting design, aesthetically pleasing (3), color and texture, overhanging walls (2), roof problems, natural features and holds (2), location and concentration of hold placement positions (2), ability to change wall angles, space developed for instruction needs (2), variety of terrain, designed with consideration of safety issues.

Routes (15, 38%)
Frequency of route changing (2), quality of route setting program (3), route descriptions (2), quantity of identified easy and moderate level routes (3), wide range of routes (easy to hard), possibilities for route engineering, good route setting for competitions, and long or tall routes (2).

Location (10, 25%)
Visibility (3), privacy, accessibility, facility amenities (2), activity area amenities, security, natural cliff area.

Size of Space (5, 13%)
adequate space for all types of activities, long or tall routes (2), plenty of bouldering areas, many top rope stations.

Discussion of responses for question 3.
Responses for Question 3 were placed in the following category themes in descending order of the number of responses received: design (17 responses, 43%), routes (15 responses, 38%), location (10 responses, 25%), and size and space (5 responses, 18%). It is interesting to note that some of the themes and/or responses listed as problems at some gyms, were also listed as features that are critical to the success of other climbing gym. The reoccurring themes and/or responses include: design, space, routes, and location.

Once again, design was at the top of the list in terms of the number of responses received concerning features that are critical to gym success. Aesthetic issues related to project design received 5 of the 17 responses in this category and included: interesting design, color and texture, aesthetically pleasing design. Structural issues were also common in the design category receiving 9 responses which included: overhanging walls, roof problems, natural features and holds, location and concentration of hold placement positions, and variety of terrain. The remaining 3 responses concern functional that are critical to gym success, and include space designed to address instruction needs and safety issues.

The theme category routes received the second most responses for features that are critical to gym success. In this category, issues related to the route setting program including: frequency of changing routes, the quality of their route setting program, the number of identified easy to moderate routes, and variety of routes (easy to hard). route descriptions, and good route setting for competitions received a total of 11 responses. Although, the aforementioned responses are critical to the operation of a climbing gym, and are important to consider when developing a program plan, they are not directly related to project development. However, structural issues concerning routes, which can be addressed in project design received 3 responses and included long or tall routes and possibilities for route engineering. It should also be noted that storage space and costs associated with equipment such as ladders, cordless power drills, hold buckets, and bags, holds, bolts, ascenders, etriers and other equipment need to be included in the project costs, to provide for the basic needs of a solid route setting program.

The theme category location received a total of nine responses on the surveys returned as a feature that was critical to the success of climbing programs. Visibility was mentioned on three surveys and privacy was mentioned on one, which is interesting to note in terms of types of users, user needs, and design features. While experienced climbers may or may not be effected by high visibility, often times novice climbers prefer a more private setting as they develop skills and confidence. Facility and activity area amenities including everything from fitness equipment to restrooms and drinking fountains were listed as important features that were critical to gym success on three surveys. In terms of the development of a climbing wall project, it is important to consider the types and proximity to amenities that will provide for quality customer service. In addition, diversification of services such as providing outdoor instruction or trips, personal training, and/or fitness equipment can provide additional revenue generating possibilities. The Good Life Climbing Gym reported their location is a natural cliff area, and states they are "the only natural cliff in the world being used as a gym."

Size and space features were reported on five surveys and included responses such as adequate space for all activities, long or tall routes, plenty of bouldering areas, and many top rope stations. It is important to consider all of these issues in the development of a comprehensive climbing wall facility and program design.

Survey Summary

Although the initial survey results were somewhat disappointing in terms of number of surveys returned and the lack of complete data in the surveys that were returned, the author was able to identify some common themes and compile information that may be useful to the climbing gym industry and those who are planning to develop climbing gyms and programs.

The results of this survey indicate that the size of climbing gyms have increased dramatically during the '90's, with most gyms reporting between 5000 and 6100 square feet of climbable surface. Some gyms are finding that they have adequate space while smaller gyms are finding that as interest in the sport grows, they are beginning to meet or exceed maximum capacity for at least certain times. Average size and percent of space dedicated to specific climbing activities was also provided to learn more about how walls are being programmed and used.

Project development costs indicated that while experienced manufactures like Radwall, Entre Prise, Nicros, Compwall and Arete Climbing Systems are being kept busy designing and constructing walls nationwide, the majority of the walls today are being built by local carpenters and climbers. The survey indicates that mean project costs range between $97,000 and $121,000, for a mean range of cost per square foot at between $14.81 and $15.47.

The qualitative data compiled from the survey yielded numerous responses that were categorized into comment themes in an effort to compile and analyze responses. It was clear that normal issues associated with the development of any construction project plagued survey respondents as well. In terms of themes that were prominent or reoccurring, design and space issues, location, and staffing and program operational issues were indicated on many of the surveys returned. It is interesting to note that some of the themes such as space, design, and location were cited in the two questions concerning problems experienced by some gyms and again in the question concerning features that are critical to gym success by other gyms.

Conclusion

The development of a comprehensive plan for a climbing facility and program is a time consuming and multi-faceted project. A detailed approach to the planning process involves research and documentation to determine: the purpose and goals of the climbing gym; the potential market groups to be served; wall space, business or operational space needs, participant capacity; facility, safety, and code requirements; desired design features and aesthetic qualities; wall materials and equipment needs; maintenance issues; and costs associated with design, construction, and business operations; and last but not least, income generating potential of the operation. Although, this will not address the issues of time spent in the planning and development process, it may reduce delays and design and equipment problems once the project is underway and on into the future of program operations. The planning process will clarify issues and spawn many ideas and concepts that can be utilized in the design and development phase.

As the survey results indicate, the design and project development phases offer many challenges and situations that can effect program operation and gym success well into the future. It is interesting to note that 22 climbing gyms (73%) of those reporting project development and programming problems were designed by climbing wall staff and/or local contractors. Although the cost of employing reputable climbing wall industry engineers, builders and artisans is significantly higher than locally developed projects, the expertise of these individuals and agencies can help overcome costly design, construction, and operational problems as well as address issues related to educating and promoting the climbing wall concept to administrators, agencies, or others who may impact the decision making process.

When working on a large scale facility, those involved in the decision making process (e.g. architects, engineers and administrators) should be encouraged to experience climbing and confer with the climbing community for their input on the design of the climbing area. It is no secret that the best climbing walls are designed by climbers, but professional assistance from architects or consultants can help to synthesize climbing and program operational needs into a coherent design.

Climbers are challenged by terrain and special obstacles and desire design features that represent problems found on natural crags and an aesthetically pleasing surface. A good combination of a generous grid of hold placement positions on wall panels, a wide variety of movable holds, and carefully planned "natural" or permanent features can create an environment where almost any type of problem can be developed. "Natural" features add to aesthetics and assist climbers in developing route finding skills, but an over abundance of "naturals" can create route setting, hold placement, and competition nightmares. Wall design features should accommodate the activities and participation that will be serviced such as beginner to advanced instruction, group events, informal climbing, competitions, and route setting. Basic design features may include aretes, dihedrals, overhanging routes, flakes chimneys, buttresses, roof problems, bouldering caves, slabs, and cracks.

The design of the wall, however, is only part of the problem. The space surrounding the wall should be adequate to support wall activities, address safety issues, provide adequate services. Considerations that would fit into these three categories include:

- Wall Activities - belay stations, waiting climbers, group instruction and spectator areas, work stations and storage areas, and customer traffic patterns
- Safety Issues - swing cones, landing surfaces and/or padding
- Adequate Services - necessary amenities like drinking fountains, restrooms, showers, rental and retail areas, vending machines or food service, conference/meeting rooms, and other activity areas

The following includes an abbreviated list of steps for the design and development of a climbing gym project. Working through these issues requires patience, education, time, and the establishment and maintenance of good working relationships with all agencies and individuals involved. Achieving success in project development requires constant communication and assurance that the end users needs and desires are heard and addressed throughout all phases of project development.

Pre-design Phase

- Develop a comprehensive plan as described in the first paragraph of the conclusion.
- If possible hold an on site meeting with users, contractor, architects and engineers to view area and surrounding spaces. If this is not possible, supply all necessary information, blue prints and supporting documents.
- Discuss purpose and uses of the wall:
  - Training/instruction
  - Open recreation
  - Competition
  - Group Events
  - Route Setting
- Discuss features desired
- Give photos or visit local crags
- Provide ideas to contractor on design features
- Give floor plan to contractor

Design Phase

- Request a three dimensional model to ensure appropriate design elements
- Detail wall, flooring, padding concerns and needs, work stations, support areas and amenities needs.

Construction Phase

- Work with contractor to make sure installation goes as planned
- Check to make sure small details are worked out and attended to:
  - Superstructure
  - Wall panels
  - Hold placement grid
  - Belay bars
  - Floor anchors

Bolt hangers
Repair training and materials
Learn and practice wall maintenance with the contractor
Work through safety issues and conduct safety checks

- Carefully consider traffic patterns, supervision and programming issues, work station placement, etc., during the construction phase and be flexible enough to change plans if needed.

The increasing demand for adventure recreation across the country in the past twenty years has triggered opportunities for a variety of activities. Some adventure programs offering only trips and workshops to local or distant climbing areas may not be meeting the needs of a growing and varied adventure recreation market. The demand for activities such as climbing in private, public and collegiate recreation centers is staggering, and as more people are exposed to the challenges and exhilaration of the sport, the demands and challenges for more climbing walls and diverse program offerings will only increase.